

# Impact Statement

## Teaching for Mastery: Mathematics

### Project/Intervention

To diminish the difference in maths attainment by developing the Teaching for Mastery (TfM) approach and to incorporate it in staff pedagogy.

### Issues and Challenges

- Confidence / training of teachers and support staff; the approach relies upon excellent subject knowledge.
- Not throwing the baby out with the bathwater: keeping our EP sense of fun, games, pace and the highest levels of challenge.
- Engagement of children (rapid graspers who are eager to work at a fast pace and demand depth).
- Reshaping lessons to include ping-pong dialogic teaching at the right times but not *all* the time.
- Mastery vs. differentiation – are these concepts at odds?

### Desired Outcomes

- Improved factual fluency (knowing number facts within 3 seconds) and procedural fluency (knowing how to calculate efficiently) in lower attainers.
- Improved engagement, deeper understanding and success in lessons for all pupils using representations.
- Children discussing maths using whole (stem) sentences.
- Reasoning and questioning for depth woven in to all lessons – access to this for all.
- Rapid graspers still making rapid progress and enjoying maths.
- Finding an EP 'way' - incorporating the TfM approach in our pedagogy and shared understanding of what makes great maths teaching.

### What we did

- Natalie took the lead for London C & NW TfM Hub, bringing together and overseeing the work of TfM specialists across six boroughs. She therefore took part in residential training alongside specialists, observed lessons in other schools and took part in some teacher research groups designed to develop the TfM approach in different schools.
- Natalie led one whole day INSET and five staff meetings to develop the big ideas underpinning the TfM approach. She then supported teachers and support staff (in the Juniors, team teaching) to adapt practice, reviewing impact in an informal, ongoing basis.
- Our January INSET included an internal Teach Meet where all staff shared an aspect of TfM going well.
- Our spring/summer lesson study trios have examined whether we are diminishing the difference and how to achieve what we've come to call, 'stealth differentiation'.

### How we did

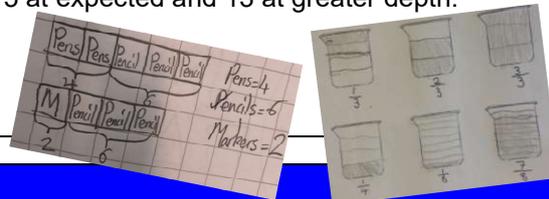
- Teachers are skilled at guiding learners to examine 'good mistakes' (Challenge Partners Review, 2018) and this is central to variation, one of the key big ideas in TfM.
- Observations of teaching by Challenge Partners showed that, 'Pupils are required to reason and think for themselves.' and 'Differentiation is appropriate, providing challenge during lessons taught through a 'mastery in mathematics approach.'
- Lesson studies across the school have helped teachers and support staff with timing and pitching interventions for lower attainers correctly.
- A greater focus on fluency of additive facts in KS1 has resulted in excellent progress and we are hopeful that this will free up their working memories to reason about deeper concepts as they move up through the school.
- Craig, our Year 2 teacher, has noted significant progress in five children who ended Year 1 working towards, or were 'at' but fragile. He has found that the TfM approach has kept the class together more and let us explore concepts more deeply without skirting over issues. During 'ping pong' guided teaching, he says he is more able to spot misconceptions quickly because the children are active participants but the steps are small. Year 2's teacher assessment of maths shows that 6% of children working towards expected levels, 68% at expected levels, and 26% at greater depth.
- Support staff have taken on the use of answering in full sentences and encourage their use when they are working with children in lessons or small groups.
- In Year 3, the children working towards and 'at', but who are still fragile, have made good progress with their confidence, number fluency, and their teacher Charlie has found they benefit from the carefully stepped teaching preceding independent work. Charlie says that children already working at expected levels have "really flown!" with the TfM approach.
- In Year 4, our lowest attainers have really enjoyed working together in the teacher-led parts of the lesson, but have definitely needed carefully differentiated practice. As in Year 3, there are some children for whom the sentence stems and visual representations have allowed them access to mathematics they wouldn't have before.
- In Years 3 and 4, teacher assessment is reflected, in most cases; in our Puma test standardised scores. However, the majority of our most fragile children are still performing poorly in tests, and this appears to be as much about tackling questions on different topics in test conditions, as it does their difficulty with mathematics.



### How we did continued...

- On average in Year 4, times table test results improved by 20% and with support staff conducting 'probes' (repetitive quizzing and practice of key times tables) with lower attainers, there was a 17% increase in test scores.
- The Year 5 Girls' Maths Club has increased the participants' confidence and their achievement in whole class lessons; we are getting this type of intervention right and balancing it with the TfM approach. Three of the girls have now got 80/80 on weekly tables tests in class, up from 50-60 in September. In the big times table test done by Miss Flood, their average score is now 89%, and their average increase since the end of Year 4 to March this year, was 20 marks.

- Maddie, our Year 5 teacher, says, "The club has been very good for pre-teaching the next day's lesson; they are involved, engaged and able to work independently. They are more flexible in how they solve problems. It's also good for recapping a previous day's learning, they know what to pick up on!"
- Rosie, our Year 6 teacher, says, "Keepy uppy has made a huge impact for all. Being mindful of small steps has improved my practice." Rosie's teacher assessment of end of KS2 maths (ahead of SATs) is that 93% have met expected levels – 2 working towards, 15 at expected and 13 at greater depth.

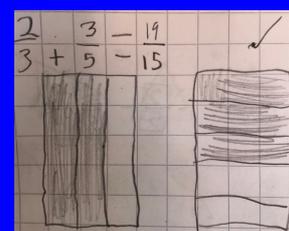


### What we learnt

- Children use stem-sentences across the week if they are left up on flip charts and referred to in subsequent lessons. This provides access for all and gives a framework for thinking. It is also very useful for support staff to see and use throughout their work with children.
- Lessons in which a new concept is introduced in a whole-class, 'ping-pong' style, need pace and questioning to extend our highest attainers.
- Differentiation is not in opposition to mastery; balancing differentiated activities with whole class conceptual teaching is best practice.
- For those children with significant special needs which mean they are working well below age expected levels, the TfM approach has had mixed results. Some of those who have emotional barriers to learning have not engaged with it and do better with one to one support. However, some have really benefited from being included in whole class lessons which focus on representations used and small steps. For maximum impact, any work beyond the initial stages of introducing a concept must be differentiated for these children.
- Teachers have found children's memories and engagement has increased when they do one 15 minute 'keepy uppy' session (revisiting a concept, a game, a quiz) and then one 45 min – 1 hour maths lesson at a different point in the day.
- Done consistently, gap analysing children's factual fluency, then teaching and quizzing (using probes), has had a big impact on factual fluency across the school.
- Children in our governor monitoring session were clear about what helps them learn: quiet environments, visual prompts and small steps. We need to listen to this!

### Next Steps

- Ensure that teachers plan and use stem sentences and the most appropriate representations for each unit of work consistently across the school.
- Capitalise on the learning from our Y1 and Y2 inter-school joint practice development group, by using the resources, approaches and possibly in-school competitions to boost additive fluency; this is key to diminishing differences earlier.
- Ensure consistent use of interventions – or probes - by support staff for both additive and multiplicative facts throughout the school, targeting children who need it most and tracking their progress.
- Induct new staff, and teachers new to year groups, in September '18.
- Continue to work on balancing types of mathematics lessons across a unit of work: introducing and representing a concept, purposeful, differentiated practice with variation, and application of the concept in different contexts.
- Take up opportunities to learn from the NCETM's early years work group, which is developing TfM in Nursery and Reception.
- Continue to include games... the fun must continue!



### Some of our pupils say:-

"I like in small steps and then we have to go. This means we don't have to remember everything in one go." Keira, Year 2.

"It's best when teachers talk maths through in steps." Tess, Year 4.

"I love using things like Numicon." Miya, Year 1.

"Working in little groups is really helpful." Amina.

"I really like maths lessons when we do something altogether, have a mini-break, then practice."

Jessica, Year 4.

"We really like helping each other and working together to give encouragement." Tawana and Maxi, Year 3.

### Some of our pupils say:-

"Teamwork is important. I like maths where you can work together with children who find it hard, with children who find it easy." Cosmo, Year 2.

"I love solving puzzles... it should be tricky." Matteo, Year 2.

"I really like maths lessons when we do something altogether, have a mini-break, then practice." Jessica, Year 4.

"I like working independently but being able to ask questions as I work, with the teacher coming past to talk. Short practices of things we've done a while ago are also great!" Luz, Year 3.